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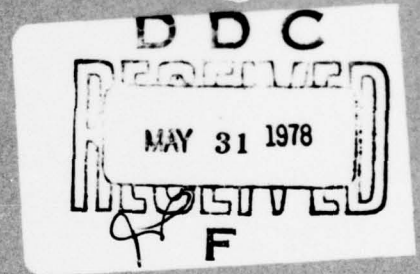
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**FINAL SUMMARY REPORT
E-2 SYSTEMS ANALYSIS**

March 1976

Prepared for
NAVAL AIR SYSTEMS COMMAND
Department of the Navy
Washington, D.C. 20360
under Contract N00018-75-C-0302



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engineering tasks were performed for NAVAIR 04. As each task was completed, the results and recommendations were submitted to NAVAIR in the form of a letter report or special report, or were included in monthly reports.

This report describes each of the tasks performed and summarizes their results. It also provides appropriate references to the reports that contain detailed discussions of the task results.

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March 1976

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Department of the Navy
Washington, D.C. 20360

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APING Research Corporation conducted various analyses of the Airborne Early Warning and Air Technical Data System of the F-20 aircraft for the Naval Air Systems Command (NA-221). The major efforts included logistics planning for the Hamilton-Standard propeller retrofit program, analysis of alternative supply support policies for the F-20, revision of removal rates for the avionics subsystems, analysis of Norfolk and CV failure data, and preparation of revised spare parts recommendations. In addition, system-effectiveness analyses and AEW/ATDS problem identification and analyses were performed for NAVAIR 04 and other logistics

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by

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K. Plessner



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ABSTRACT

ARINC Research Corporation conducted various analyses of the Airborne Early Warning and Air Tactical Data System of the E-2C aircraft for the Naval Air Systems Command (PMA-231). The major efforts included logistics planning for the Hamilton-Standard propeller retrofit program, analysis of alternative supply-support policies for the E-2C, revision of removal rates for the avionic subsystems, analysis of Norfolk and CV failure data, and preparation of revised spares recommendations. In addition, system-effectiveness analyses and AEW/ATDS problem identification and analyses were performed for NAVAIR 05, and other logistics engineering tasks were performed for NAVAIR 04. As each task was completed, the results and recommendations were submitted to NAVAIR in the form of a letter report or special report, or were included in monthly reports.

This report describes each of the tasks performed and summarizes their results. It also provides appropriate references to the reports that contain detailed discussions of the task results.

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CHAPTER ONE

INTRODUCTION

1.1 SCOPE OF EFFORT

This report presents the results of a 14-month effort (1 January 1975 through 29 February 1976) to conduct AEW/ATDS systems analysis for the E-2 Program Manager (PMA-231). The work was performed by ARINC Research Corporation under Contract N00019-75-C-0302, Line Item 1.

Contractual activity was concerned primarily with the following major areas:

- ATDS/E-2 usage-data analysis, maintenance-rate updating, and spares recommendations for the ASO
- Logistics planning for the propeller system retrofit program
- Problem-area identification, investigation, and analysis
- Collection and analysis of data from Norfolk and CV operations
- Engineering analysis in support of the Avionics System Project Office and the Class Desk

Additional special tasks were also performed on a rapid-response basis where required.

1.2 FORMAT OF REPORT

The program tasks and findings are described in Chapters Two, Three, and Four. Details of the efforts are omitted in cases where results have already been presented in monthly status letters or special reports. References to specific detailed reports are given as appropriate.

Chapter Two summarizes the extensive ARINC Research work performed for NAVAIR 04. This includes a major effort in support of the Hamilton-Standard propeller retrofit program and support to the Aviation Supply Office in the update of removal rates, IOL computations, support-policy evaluations, and other related supply activities.

Chapter Three summarizes the avionics engineering analyses performed for NAVAIR 05. The more significant engineering investigations and equipment problems analyzed are described.

Chapter Four summarizes the management support performed by ARINC Research staff and consultants in response to Program Office requirements.

The appendix lists all of the items submitted by ARINC Research Corporation under the contract.

CHAPTER TWO

INTEGRATED LOGISTIC SUPPORT

2.1 PROPELLER SYSTEM ILS ANALYSIS AND MONITORING

ARINC Research provided continuing support to NAVAIR PMA-231 and NAVAIR 4102 in monitoring the retrofitting of the Hamilton-Standard model 54460-1 propeller system to the C-2, E-2B, and E-2C. In addition, we performed ILS analyses in the areas of GSE, QECs, and shipset payback. The following paragraphs summarize the ARINC Research efforts during the contract period.

2.1.1 Retrofit Scheduling

We had prepared the master Hamilton-Standard propeller retrofit program schedule in an earlier contract period; during this contract period we monitored the total program status and reported significant management information to NAVAIR-4102A1 and PMA-231. We periodically revised the master schedule to meet the needs of a dynamic program and delivered updated milestone charts to cognizant individuals on a quarterly basis. (Appendix, Items 36, 54, 69, 84)

2.1.2 Hamilton-Standard Tool Requirements

Early in 1975, it became apparent that the tools (PGSE) for proper support of the Hamilton-Standard propeller would not be available to the fleet when required, because of an excessive administrative lead time at ASO. Working in conjunction with NAEC Lakehurst, we reviewed the gross and net requirements for all tooling, reviewed the site IMRLs, developed an allocation plan, and expedited the procurement and delivery of the necessary PGSE. (Appendix, Items 10, 18, 19, 21, 38, 41, 60, 64, 70, 72, 78)

2.1.3 Shipset Payback Plan

In order to provide adequate spares to the fleet and to the CLAMP program, it was necessary to dismantle seven propeller shipsets. Since this was designed as only a short-term solution to the lack of spares, we developed a plan to rebuild the shipsets by setting aside a portion of the production spares deliveries. When fully implemented, this plan will have the seven dismantled shipsets completely rebuilt. (Appendix, Item 56)

2.1.4 Related Tasks

In addition to the major tasks described above, ARINC Research participated in virtually all phases of logistic support of the propeller retrofit program. Some of the more significant areas were:

- Monitoring the distribution of PPC-84 kits
- Planning and monitoring the distribution of repairable and consumable spares
- Pursuing the correction of SM&R code errors for propeller components
- Monitoring QEC deliveries from GAC and QEC modification kits from Hamilton-Standard
- Identifying the need for parts for quick propeller changes
- Monitoring the procurement of cowl and sidebeam spares modification kits

2.2 ASO SUPPORT FOR E-2 SYSTEMS

ARINC Research assisted the Aviation Supply Office (Weapons Logistics and Technical Divisions) in providing input data for the Master Data File and Master Allowance File. This information was primarily in the form of revised removal rates and IOL spreads. Submissions of data spanned the entire contract period (Appendix, Items 4, 11, 15, 26, 32, 33, 42, 44, 53, 61, 85, 88) and included the following systems:

CP-1085/AS	Air Data Computer
AN/ARQ-34	HF Communications
AN/APA-172	Control Indicator Group
AN/ALR-59	Passive Detection System
AN/APS-120	Radar Set
OL-76/AP	IFF Detector-Processor
OL-93/AP	Radar Detector-Processor
AN/ASM-440	In-Flight Performance Monitor

We also reviewed the AVCAL of the USS INDEPENDENCE to ensure a proper allowance of spares for the Hamilton-Standard propeller, as well as the AVCAL of the USS SARATOGA to ensure a proper allowance of spares for the CP-1085/AS and AN/ARQ-34. The cruises of these two ships represented the first CV deployments under Navy support for the referenced systems. (Appendix, Items 22, 37)

2.3 ALTERNATIVE SUPPLY-SUPPORT POLICIES

During the contract period, ARINC Research continued the investigation of the effect of CNO-imposed range and depth restrictions on aircraft availability in an E-2 squadron. Working in close cooperation with AIR 4103 and the ASO, we obtained an extract of the Master Data File for the E-2C peculiar material contained in twelve E-2C avionic systems and reformatted it into provisioning packages for use with the Navy IOL Optimization Model. Where applicable, we included final MEA removal rates in the data set.

We then exercised the Navy Model for the E-2C provisioning packages with variable range-restriction (demand floor) and depth-restriction (item cutoff) parameters over a target AWP rate varying from 30 percent to 1 percent. We submitted the results of this analysis to NAVAIR, OPNAV, and ASO in October 1975 (Appendix, Items 68, 73) with the following major conclusions:

- For a typical E-2 CV outfitting, 68 percent of candidate items (including most SRAs) do not qualify for stockage because of demand floors.
- At a given AWP rate, the cost to provision with demand-floor rules is greater than without demand-floor rules because the model "buys" expensive WRAs to support the removals of the low-cost nonstocked SRAs.
- The currently used default values of depth-restriction criteria cause the model to compute an overly optimistic value of AWP rates.

2.4 FIELD REMOVAL DATA COLLECTION AND ANALYSIS

During this contract period, ARINC Research continued to accumulate removal data of E-2C WRAs and SRAs from Norfolk and from deployed aircraft. We computed the removal trends and submitted this information to NAVAIR and the ASO. (Appendix, Items 65, 89)

These submissions of removal data contained averages over several time periods so that a trend could be established. They also compared the demonstrated removals with the MEA rates to determine the removal rates experienced in fleet operation in relation to predicted rates.

WRAs and SRAs that exceeded their predicted removal rates significantly (as determined by a statistical test of significance at the 95-percent confidence level) were singled out for further investigation with fleet technicians and Grumman engineering personnel. As a result of these investigations, we identified a number of corrective actions for high-removal units and submitted a summary to NAVAIR.

2.5 GENERAL TASK ASSIGNMENTS

2.5.1 E-2 Supply Support Studies

We prepared a series of letter reports (Appendix, Items 20, 24, 48, 77) documenting a continuing investigation into repairable- and consumable-item support for NORS, CLAMP, and NARF "G" condition requisitions. The first two reports concerned the quantity, source of supply, and supply-system delivery times of E-2B NORS and NARF "G" condition rework requisitions. These reports established that materials under the cognizance of ASO and DESC were the most frequently requisitioned and took the longest time to be delivered.

The third report examined the specific items of supply that were appearing consistently in high NORS and high "G" condition lists and established a significant correlation between them. The fourth report continued the investigation of the NARF "G" condition problems, recommending ways to alleviate the piece-part shortages that were causing the "G" condition situation.

2.5.2 E-2 Rudder Tab Bushings

In an investigation of the availability to the fleet of E-2 rudder tab bushings, we discovered that while these bushings are part of a 315-day scheduled inspection, ASO files did not maintain these bushings as an E-2 interest item. We recommended that ASO procure a sufficient quantity to support fleet operations and make these bushings available under one stock number in the form of a kit. (Appendix, Item 58)

2.5.3 ILS Planning and Management

During the contract period, we continued to support the Program Office and the APML in ILS planning efforts for major aircraft modification programs such as AN/APS-125 ARPS and AN/ALR-59 PDS Mod "A". We also participated as members of the Integrated Logistic Support Management Team (ILSMT) at the E-2/C-2 conference held in October and the AN/ASN-92(V) CAINS conference held in September.

CHAPTER THREE

ENGINEERING ANALYSIS ACTIVITIES

ARINC Research conducted several engineering analyses on specific systems and equipments that were demonstrating poor reliability, maintainability, or availability. The analytical investigations varied in depth depending on the tasks, but they generally involved the use of 3M data, interviews with maintenance and flight personnel, and technical analysis of the system.

3.1 COMPUTER SYSTEMS

We evaluated the AN/ASA-27A (E-2B computer) and the OL-77/ASQ (E-2C computer) (Appendix, Items 1, 13) and drew the following major conclusions:

8K memories in both the E-2B and E-2C are major contributors to NOR/RMC time. Both hardware deficiencies and lack of support are problems.

The PP-6266/ASA-27A Rectifier Transformer module and the Time Servo modules require reliability improvement.

Multiple IC chip failures appear to be caused by transient voltages and filter-capacitor failures in the 8K memory.

3.2 OS-144 OSCILLOSCOPE

We performed an engineering evaluation on the OS-144/ASM-33B, which is the oscilloscope WRA of the E-2B In-Flight Performance Monitor. The report submitted addressed the logistic and technical problems that affect the OS-144, actions that can be taken to improve the availability, and alternatives to replacing the OS-144 with the OS-225. (Appendix, Items 2, 12)

As a follow-up to this report, we submitted documentation on substitute components that could be utilized in lieu of some of the more critical unavailable items. (Appendix, Items 3, 23)

3.3 SYNCHROPHASER DESIGN REVIEW

At the direction of AIR-53622D, we conducted an in-depth design review of a Hamilton-Standard ECP to modify the E-2 synchrophaser and its associated GSE. This task included development and evaluation of alternative approaches to correcting the deficiencies in the existing synchrophaser system (Appendix, Item 87). The following major items were documented:

- Unused amplifier modules should be protected by means of cabling rather than switching.
- The RFI/EMI protection proposed by Hamilton-Standard is incomplete.
- Changes to disable the rate feedback loop during generator switching should be approved.
- Modification of synchrophaser GSE is unnecessary, other than to add protection to unused amplifier modules.

3.4 EVALUATION OF PROPELLER VIBRATION ANALYZER (PVA)

As a result of an action item at the 1975 E-2/C-2 ILSMT, ARINC Research, in conjunction with Wing 12 maintenance personnel, conducted a side-by-side evaluation of the existing Grumman PVA and models from two other manufacturers (PMC and Spectral Dynamics).

Upon completion of the evaluation, COMAEWWING Twelve recommended that the Navy procure the PMC unit, provided that its case is hardened and other minor modifications are made to ensure that the unit will not be damaged in the military environment. It was further recommended that the MBL24 transducers be evaluated for evidence of deterioration of eddy current damping characteristics and that procedures be established to allow sequential engine run-up and balance testing.

3.5 GENERAL TASK ASSIGNMENTS

In addition to the major tasks described above, numerous analyses of more limited scope or duration were conducted (Appendix, Items 5, 6, 66, 81). These included the following:

- An investigation of failure history and reliability changes, and a life-cycle-cost study of the AN/APS-120 coaxitron
- An examination of AN/APS-120 antenna modifications required for the ARPS configuration
- An investigation of reliability problems in the HD-419/APS-96 Pressurization Set
- An examination of workmanship and quality-control problems associated with the E-2C computer wiring harness
- A review of a reliability-improvement report on the AN/ASM-198 written by the Pacific Missile Test Center, Pt. Mugu

CHAPTER FOUR

MANAGEMENT DOCUMENTATION

4.1 GENERAL

During the entire contract period, ARINC Research continued to provide management support and documentation to the E-2 Project Manager, ASPO, Class Deck, and APML. This assistance encompassed a broad range of tasks, including OSIP coordination, budgetary analysis, GFEL documentation, and a quick-reaction capability for urgent management problems.

4.2 OSIP PLANNING

We provided assistance to NAVAIR in the development of a coordinated set of planning documents for input to the FY-78 Aircraft Modification Budget. This involved assistance to equipment engineers in developing cost and schedule estimates, as well as program coordination with the Class Desk Officer and the OPNAV program sponsor.

4.3 ADVANCED RADAR PROCESSING SYSTEM (ARPS)

We provided data that assisted in negotiations between NAVAIR and COMOPTEVFOR regarding details of the IOT&E test plan. Upon release of the final plan, we continued the review of documents and reports and the updating of special ARPS files. This preliminary work was necessary prior to the commencement of NPE-II test flights in November 1975.

4.4 OTHER TASK ASSIGNMENTS

We provided support to the Program Office in response to inquiries from foreign governments for price and availability information. We attended planning conferences and coordinated the assembly of data from many NAVAIR sources and the presentation of these data in prescribed formats.

We provided support to the Avionics System Project Office in revising Government Furnished Equipment Lists (GFELs); this work required coordination with Grumman. At the conclusion of the effort, the backlog of GFEL changes had been substantially reduced.

APPENDIX INFORMATION AND DATA SUBMITTALS				
Item Number	Item	Form of Submittal	Date Submitted	Submitted To
1.	Problem Report for the CP-879 and the CP-1084 OL-77/ASQ Digital Data Computer	Informal	1/10/75	533315 & 533341
2.	Problem Report for the OS-144 Oscilloscope	Informal	1/10/75	533315 & 533341
3.	OS-144 Parts Analysis	Letter-FASG/OEP/A&V-75	1/22/75	533341
4.	Increased Spares Requirements Due to Removal-Rate Revisions	Informal	1/28/75	4102A2
5.	Special Report on Coaxitron	Letter-FASG/OEP/A&V-75-365	2/3/75	4102A2
6.	Failure History - Attitude Indicators	Informal	1/3/75 1/28/75	ASO SC 4102A2
7.	Status Letter No. 1	Letter-FASG/OEP/A&V-75-383	2/13/75	PMA-231
8.	Hamilton-Standard Consumable Part Delivery Status	Informal	2/3/75	4102A2
9.	Hamilton-Standard QEC Mod Kit/PPC-84 Kit Delivery Status and Defining Documentation	Informal	2/20/75	ASO
10.	Review of RVAW-110 Tool Deficiencies	Informal	2/25/75	4102A3
11.	Outfitting Lists for ADC and HF Communications	Informal	3/4/75	ASO & GAC
12.	Problem Report for the OS-144 Oscilloscope	Letter-FASG/ASM/EW-75-364	2/3/75	PMA-231
13.	Problem Report for the CP-879 AN/ASA-27A and the CP-1084 OL-77/ASQ Digital Data Computer	Letter-FASG/OEP/A&V-75-369	2/3/75	PMA-231
14.	IC Order Cancellations at DESC	Letter-FASG/OEP/A&V-75-389	2/20/75	AIR-4102A2
15.	MEA Background Data on PDS and CIG Maintenance Rates	Informal	3/4/75	ASO TEM-51A
16.	IOL Indenturing for QR and QX Systems	Informal	3/5/75	ASO-AC
17.	Status Letter No. 2	Letter-FASG/OEP/A&V-75-392	3/14/75	PMA-231
18.	Repairable and Consumable Site Outfitting Allocation Plan	Informal	3/24/75	AIR-41133A
19.	GSE Tooling List for O, IL, IV, and Depot	Informal	3/24/75	AIR-41133A
20.	Quantity of NORS Requisitions by COG	Letter-FASG/OEP/A&V-75-396	4/1/75	AIR-4102A1
21.	Hamilton-Standard Tool Requirements Fleetwide and Priority Action Recommendations	Informal	4/3/75	AIR-4102A AIR-41711C ASO-SCW 4-5
22.	Status Letter No. 3	Letter-FASG/OEP/A&V-75-404	4/14/75	PMA-231
23.	OS-144 Edgelit Panels	Letter-FASG/OEP/A&V-75-403	4/14/75	AIR-4102A2
24.	Delivery Times of NORS Requisitions (by COG)	Letter-FASG/OEP/A&V-75-406	4/16/75	AIR-4102A1
25.	ARPS Data Requirements Review	Informal	4/21/75	AIR-5102C
26.	Multiple WRA Breakout	Informal	5/9/75	AC Division
27.	Fourth Status Letter	Letter-FASG/OEP/A&V-75-412	5/14/75	PMA-231
28.	E-2B Logistic/Design Investigation Summary (1970-1975)	Informal	5/21/75	PMA-231
29.	Status of Digital Protractor Documentation	Informal	5/27/75	NARF NORIS
30.	Propeller Packaging Parameters	Informal	5/27/75	AIR-4102A1
31.	E-2C Items (Magnetic Tape)	Informal	5/29/75	AIR-4013
32.	Rate Update Card Deck	Informal	5/30/75	AC Division
33.	Airframe IOL (including H-S recommendations) - duplicate copy	Informal	5/30/75	WLM-7
34.	AN/ALR-59 TWT Recommendations	Informal	5/30/75	WLM-7-20
35.	Miscellaneous Analyses	Informal	5/30/75	WLM-7-10
36.	Conversion Plan Update	Informal	6/2/75	AIR-4102A1
37.	Fifth Status Letter	Letter-FASG/OEP/A&V-75-419	6/16/75	PMA-231
38.	IMRL Status Review	Informal	6/18/75	Wing 12
39.	Consumable Parts Status	Informal	6/23/75	AIR-4102A1
40.	QEC Status and Recommendations	Informal	6/25/75	AIR-4102A1
41.	Intermediate-Vessel Hamilton-Standard Tooling	Informal	7/8/75	COMNAVIRLANT
42.	E-2B Spares Requirements (Reserves)	Informal	7/14/75	PMA-231
43.	Sixth Monthly Status Letter	Letter-FASG/OEP/A&V-75-428	7/15/75	PMA-231
44.	Miscellaneous IFPM Spares Results	Informal	7/17/75	ASO-WLM-7
45.	QEC Delivery Status	Informal	7/25/75	AIR-4102A1

(continued)

APPENDIX (continued)				
Item Number	Item	Form of Submittal	Date Submitted	Submitted To
46.	Status of Hamilton-Standard Repairables Shipped to NORVA	Informal	7/29/75	CLAMP Manager
47.	E-2B Airframe/E-2C Propeller Match Analysis	Informal	7/31/75	AIR-536
48.	Analysis of E-2B NORS Requisitions	Letter-FASG/OEP/A&V-75-430	7/31/75	AIR-4102A1
49.	Data Concerning Shipments to CUBI	Informal	8/6/75	AIRPAC, AIR-4102A2
50.	Identification of Need for Air Baffle Assembly	Informal	8/11/75	AIR-4102A1
51.	PVA Asset Configuration and Locations	Informal	8/13/75	Wing 12
52.	Seventh Status Letter	Letter-FASG/OEP/A&V-75-434	8/15/75	PMA-231
53.	Provisioning Factors for IPPM, OL-93 and APS-120	Informal	8/17/75	ASO-WLM-7
54.	Updated Propeller Conversion Plan	Informal	8/22/75	AIR-4102A1
55.	VAST Blue Line Connectors	Letter-FASG/OEP/A&V-75-439	9/2/75	AIR-53424B
56.	Shipset Payback Plan	Letter-FASG/OEP/A&V-75-591	9/3/75	AIR-4102A1
57.	8K Memory Testing	Letter-FASG/OEP/A&V-75-597	9/15/75	AIR-533311A
58.	E-2 Rudder Tab Bushings	Letter-FASG/OEP/A&V-75-604	9/22/75	AIR-4102A1
59.	Data on Raytheon Integrated Circuits	Informal	9/9/75	AIR-4102A1
60.	Critical Hamilton-Standard Tools Data	Informal	9/15/75	AIRLANT AIR-4102A ASO SCW 4-5
61.	ASO Support Data for E-2 System Provisioning Factors	Informal	9/16/75	ASO WLM 7-10
62.	MRF - Upper and Lower Baffles	Informal	9/26/75	AIR-4112
63.	APA-172 CIG-Requirement for Inclusion in Installation Plan	Informal	9/12/75	AIR-533D1 AIR-5102 AIRLANT
64.	Hamilton-Standard Tool Data for C-2 Aircraft	Informal	9/26/75	D. Reade - GAC
65.	Comparison of Predicted and Actual Fleet Removal Rates	Letter-FASG/OEP/A&V-75-433	9/2/75	AIR-4102A1
66.	Ninth Status Letter	Letter-FASG/OEP/A&V-75-613	10/9/75	PMA-231
67.	Propeller Fleet Removal Rate Update (Allison vs. Hamilton-Standard)	Informal	10/9/75	PMA-231
68.	Analysis of Alternative Support Policies	Letter-FASG/OEP/A&V-75-601	10/15/75	AIR-4102A1
69.	Conversion Schedule Update	Informal	10/22/75	AIR-4102A1
70.	Complete Hamilton-Standard Tool Procurement Status	Informal	10/23/75	NAEC ASO
71.	QEC Delivery Schedule	Letter-FASG/OEP/A&V-75-638	11/06/75	AIR-4102A1
72.	Hamilton-Standard Tool Allocation	Letter-FASG/OEP/A&V-75-641	11/11/75	NAEC
73.	Follow-up to E-2 Support Policy Analysis	Letter-FASG/OEP/A&V-75-652	11/25/75	AIR-4102A1
74.	E-2B/E-2C Pilots' Windshields	Letter-FASG/OEP/A&V-75-662	12/5/75	AIR-4102A1
75.	Review of Hamilton-Standard Synchrophaser ECP (Preliminary)	Letter-FASG/OEP/A&V-75-668	12/16/75	AIR-53622D
76.	Vapor Cycle Evaporator Removal Rates	Letter-FASG/OEP/A&V-75-669	12/16/75	ASO (WLM 7-41)
77.	E-2 Supply Support at NARF North Island	Letter-FASG/OEP/A&V-75-675	12/31/75	AIR-4102A1
78.	Summary of AIRPAC IMRL Deletions Impact	Informal	12/12/75	AIR-4102A1, 53622
79.	QPC Kit Requirements	Informal	12/9/75	MELR Committee
80.	Allison Propeller Spares Status	Informal	12/16/75	AIR-53622
81.	Eleventh Status Letter	Letter-FASG/OEP/A&V-75-664	12/2/75	PMA-231
82.	MLG Struts, O&I Publications Changes	Letter-FASG/OEP/A&V-76-503	1/15/76	AIR-5102C
83.	Investigation of Avionics Problem Areas	Informal	1/15/76	AIR-5102C
84.	Twelfth Status Letter	Letter-FASG/OEP/A&V-76-506	1/15/76	PMA-231
85.	IOL Spreads for NIIN 126-6658	Letter-FASG/OEP/A&V-76-519	2/9/76	ASO(WLM 7-41)
86.	Norfolk Flight-Hour Program vs. WSPD	Letter-FASG/OEP/A&V-76-521	2/17/76	PMA-231
87.	Review of Hamilton-Standard Synchrophaser ECP	Letter-FASG/OEP/A&V-76-517	2/18/76	AIR-53622D
88.	Submittals of IOL Spreads	Letter-FASG/OEP/A&V-76-525	2/26/76	ASO(TEM 1-51)
89.	Fleet Removal Data Collection (15-month summary)	Letter-FASG/OEP/A&V-76-541	2/27/76	AIR-4102A1